
CHAPTER IV

Refuge Plans



*U.S. DEPARTMENT OF THE INTERIOR
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MID-PACIFIC REGION*

CHAPTER IV

REFUGE PLANS

This chapter presents discussions of the land and water resources for each of the 15 managed wetland areas investigated. In addition, alternative plans to provide water supplies are provided. These plans were developed following extensive investigations of each area, and using the evaluation criteria provided in the previous chapter.

Selected plans will be presented in the Refuge Water Supply Planning Report and will be based on the findings of investigations presented in this report, as well as those of the Water Contracting EIS's.

Due to the complexity and amount of information developed under this study, 15 separate subchapters were prepared for Chapter IV to facilitate their review. The areas are presented in respect to their general geographical location, as shown in Figure IV-1.

- o Chapter IV A - Modoc National Wildlife Refuge
- o Chapter IV B - Sacramento National Wildlife Refuge
- o Chapter IV C - Delevan National Wildlife Refuge
- o Chapter IV D - Colusa National Wildlife Refuge
- o Chapter IV E - Sutter National Wildlife Refuge
- o Chapter IV F - Gray Lodge Wildlife Management Area
- o Chapter IV G - Grassland Resource Conservation District
- o Chapter IV H - Volta Wildlife Management Area
- o Chapter IV I - Los Banos Wildlife Management Area
- o Chapter IV J - Kesterson National Wildlife Refuge
- o Chapter IV K - San Luis National Wildlife Refuge
- o Chapter IV L - Merced National Wildlife Refuge
- o Chapter IV M - Mendota Wildlife Management Area
- o Chapter IV N - Pixley National Wildlife Refuge
- o Chapter IV O - Kern National Wildlife Refuge

Conjunctive use was evaluated for each of the refuges. Under conjunctive use alternatives, surface water would be used for the entire refuge water supply during wet years when adequate surface water supplies were available. During drought years, groundwater would be used for the entire refuge water supply. During other years, a combination of surface water and groundwater supplies may be used. The primary disadvantage of conjunctive use programs is that both surface water and groundwater systems must be sized to deliver full water needs, resulting in large, less frequently used facilities and associated higher costs. Most of the refuges would require construction of wells to provide groundwater to the refuges, as well as construction of surface water conveyance system improvements.

One possible method to reduce the size and number of groundwater facilities would be to construct regional well-fields and artificial recharge facilities in areas where groundwater basin characteristics are suitable. The regional basins would be operated like surface water reservoirs with surplus water stored underground during wet years for use in dry years. Water pumped from the well field would be diverted into regional conveyance facilities, along with available surface water, to provide a firm supply to requestors. It may be possible to locate well fields strategically with respect to conveyance facilities to best use existing capacity and reduce the need for additional capacity. Conveyance capacity in regional conveyance facilities is normally underutilized during off-peak water use periods and would be utilized to convey intermittent water to artificial recharge basins. In addition to recharge basins, reregulation storage would be required to deliver water at the time and place needed.

Another method to reduce the size and number of groundwater facilities would be to pump groundwater from on-refuge wells on a year-round basis. The savings in reservoir releases could be used to provide supplemental surface water to the refuges.

However, additional planning studies would be required prior to implementation of any of these plans. Therefore, for the purposes of this report, the conjunctive use alternatives evaluated the number of wells required to provide each refuge with peak month water demands for each water supply level. If regional well fields or year-round pumping was implemented, the total number of wells could be significantly reduced.

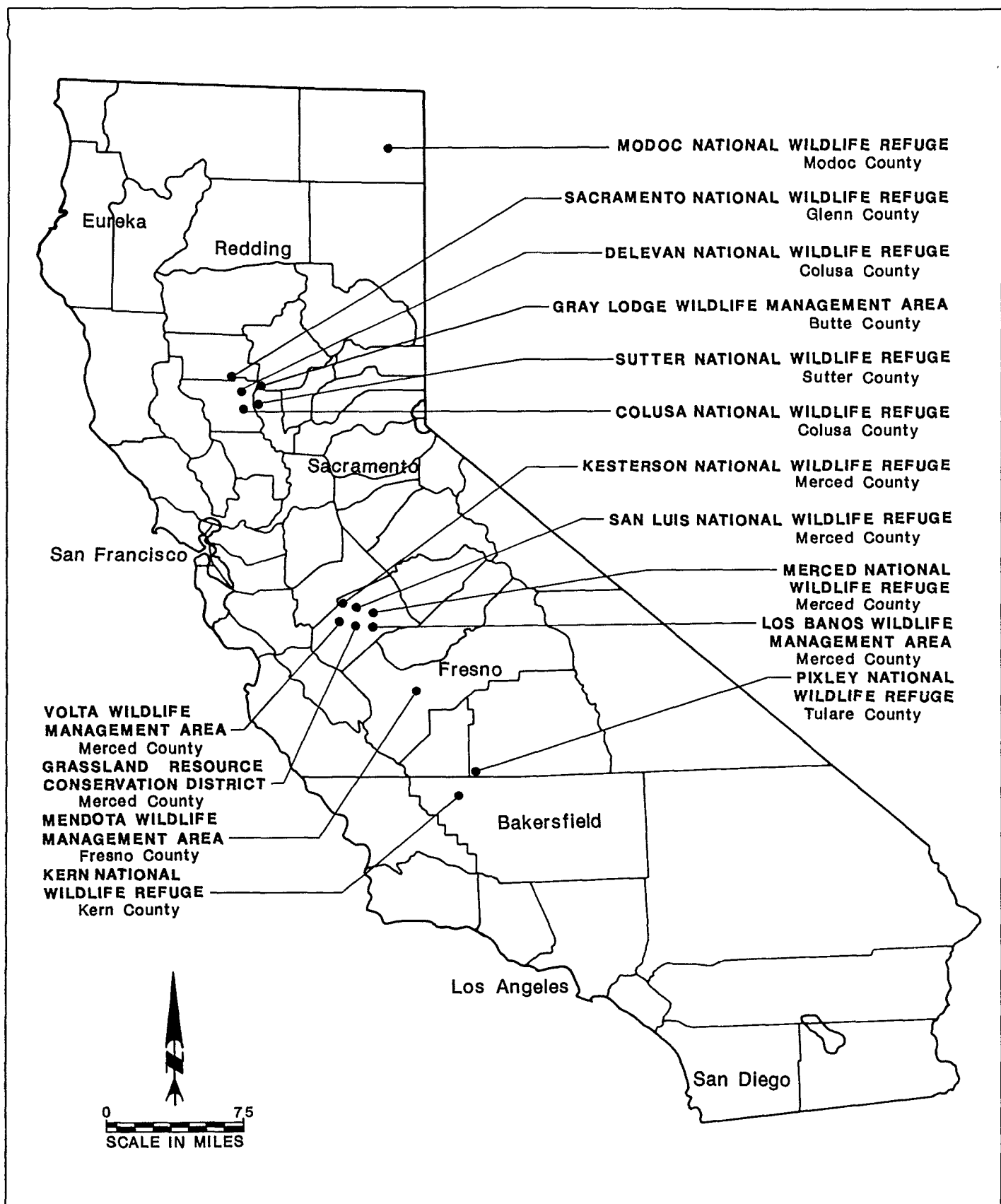


FIGURE IV-1

STUDY AREA AND REFUGE LOCATION MAP

